



ISCAR On Going R & D

ISCAR 研发部 ISCAR 销售 Mix 2005

New Items 35%

不到三年更新一次

10% 员工 在研发部工作
6% ISCAR 销售额用于投资 研发部

开放的研发部

Fast Metal Removal 快速金属切割

1 Thread

FEED **FEED** **MILL** **SOLID**

TURN **TURN** **TURN** **TURN**

Technical specifications and product images for various cutting tools.

快速金属切削理念

- 刀具材料
- 刀具结构
- 加工方式
- 加工系统
- 刀具快换

IMC

Everything You Know About Tooling is

Going to Change!

DRILL TURN MILL TOOLING

IMC

ISCAR UP GRADE

刀片材质 新升代

IMC

ISCAR GRADE CHART - CVD COATED

ISCAR GRADE	ISO	COATING LAYERS
IC418 CVD COATED	K10-K25	TiC Al ₂ O ₃
IC428 CVD COATED	K05-K20 P05-P15 H15-H25	TiC Al ₂ O ₃
IC4028 CVD COATED	K05-K20	TiCN Al ₂ O ₃ TiN
IC4050 CVD COATED	K20-K40 P20-P50 M20-M30	TiCN Al ₂ O ₃ TiN
IC520M CVD COATED	P15-P35 M10-M30 K10-K30	TiCN
IC635 CVD COATED	P30-P50 M20-M40	TiN TiC TiN
IC8048 CVD COATED	P05-P30 K05-K20	TiC TiN Al ₂ O ₃
IC9007 CVD COATED	K10-K20 P10-P20	TiCN Al ₂ O ₃ TiN
IC9015 CVD COATED	P10-P30 K10-K25	TiCN Al ₂ O ₃ TiN
IC9025 CVD COATED	P20-P30 M15-M30	TiCN Al ₂ O ₃ TiN

ALTEC IC9350
[P20-P45] [M15-M30]

A very tough substrate with a cobalt enriched layer combined with a MTCVD TiCN and Al₂O₃ CVD coating. Provides excellent toughness and good wear resistance on steel for interrupted and unstable cutting conditions.

Grades for GRIP Groove-Turn Inserts

ALTEC IC908
[P15-P30] [M20-M30] [K20-K40] [N15-N25] [S15-S25] [H40-H50]

A hard, fine grain substrate with excellent chipping resistance, combined with a new ALTEC PVD coating. Provides high wear and oxidation resistance in parting and grooving applications. Recommended for a very wide range of materials and machining conditions.

DT7150
[K05-K25]

A tough substrate with a dual MTCVD Al₂O₃ and TiAlN PVD coating. Recommended for medium to high cutting speeds for machining of both grey and nodular cast iron. Features high wear and chipping resistance.

Milling Cast Iron at High Cutting Speeds

Tool Life Comparison

Material: GG25
Cutting speed: 500 m/min
Feed per tooth: 0.25 mm
Depth of cut: 2.5 mm

Tool Life Comparison

Material: GG25
Cutting speed: 300 m/min
Feed per tooth: 0.20 mm
Depth of cut: 2.5 mm

IC900 General milling

Tool Life Comparison of Existing IC900 and the New IC900 AL-TEC

Material: SAE 1060 170 HBN
Cutting speed: 180 m/min
Feed per tooth: 0.07 mm
Depth of cut: 1.0 mm
Width of cut: 1.0 mm

Tool Life Comparison of Existing IC903 and the New IC903 AL-TEC

Material: A6063 T6
Cutting speed: 150 m/min
Feed per tooth: 0.1 mm
Depth of cut: 1.0 mm
Width of cut: 0.65 mm

Drilling Length

Material: GG 25
Cutting speed: 310 m/min
Feed per tooth: 0.14 mm
Depth of hole: 80 mm
With coolant

¹⁾ Central insert on the drill
²⁾ Outer insert on the drill

Tool Life Comparison

Material: SAE 1060 170 HBN
Cutting speed: 200 m/min
Feed per tooth: 0.16 mm
Depth of hole: 55 mm
With coolant

ISCAR UP TURN

车刀 新升代

IMC

高金属切除率系列 HELITURN

螺丝夹紧使负载减小

SLANR/L. 刀杆尺寸: 25, 32 & 40mm

LNMX 1506..R/L-HT 刀片
具有 4 个切刃

新一代车刀系列

HELITURN Features

Application Range

- $ap=8\text{mm}$
- $(.315")$
- $f=0.6\text{mm/rev}$
- $(.024\text{ipr})$

■ Low cutting forces
Free chipflow

Near Tail Stock

Vs. CNMG 190616
(644)

ISCAR UP GRADE!

Member of ISCAR

HELITURN TG (Tangential)

$Ap \text{ max} = 15 \text{ mm}$

$df \text{ max} = 1 \text{ mm/rev}$

HELITURN TG (Tangential)

Tangential Geometry for Incredible Feed Rates and Increased Tool Life for Fast Metal Removal

LNMX 22

LNMX 15

LNMX 11

01-TEC
9160 New MFCO AlTiN Coating for Turning on Steel - High Cutting Speed

9250 New MFCO AlTiN Coating for Turning on Steel - Moderate to High Cutting Speed

9350 New MFCO AlTiN Coating for Interrupted Turning on Steel

ISCAR UP GRADE

Number of cutting edges	4	2
Vc (m/min)	160	130
F (mm/rev)	0.80	0.65
D.O.C. (mm)	10.5-12.5	10.5-12.5
Turning length (mm)	820	820
Machine load	75%	60%
Wear after 1 part	0.15	0.25

Results:

1. Rough turning time has been reduced by 30%.
2. The HELITURN provides double the cutting corners compared to CNMG insert.
3. The lesser wear and no deformation guarantees better operating reliability.

HELITURN TG (TanGential)
Silicon Nitride Insert for Cast Iron
High Speed Machining
Fast Metal Removal

ISCAR **TURN UP GRADE**

Member IMC Group

10% Lower Cutting Forces,
50% Better Tool Life
for Fast Metal Removal

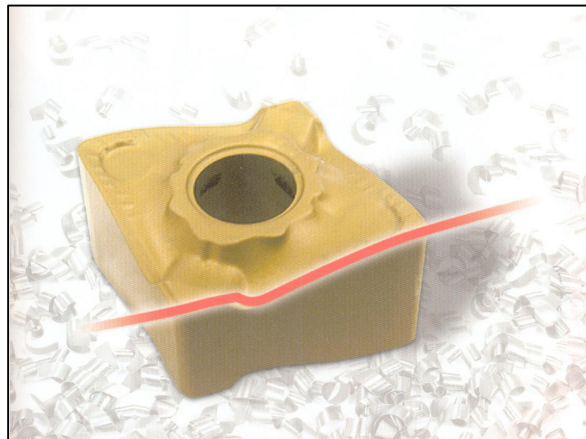
ISCAR **TURN UP GRADE**

Member IMC Group

OX-TEC
9150 New MTCVD Al₂O₃ Coating for turning on Steel at High Cutting Speeds
 ISO 9001 ISO 14001 ISO 9002

9350 New MTCVD Al₂O₃ Coating for Interrupted Turning on Steel
 ISO 9001 ISO 14001

9250 New MTCVD Al₂O₃ Coating for Turning on Steel in Medium to High Cutting Speeds
 ISO 9001 ISO 14001



SELF-GRIP Fix
The Original Parting Insert
is Now Stronger
for Fast Metal Removal

ISCAR **GRIP UP GRADE**

Member IMC Group

ALTEC
908 New PVD AlTiN Coating for a Wide Range of Materials. Used for Parting and Grooving Applications.
 ISO 9001 ISO 14001 ISO 9002 ISO 14002

IG1023
 A tough, TAN/AlTiN PVD coated grade. Used for rough parting applications at low speeds, high feeds and interrupted cut. High resistance to mechanical and thermal shock.
 ISO 9001 ISO 14001

TANG-GRIP
Tangential Grip Clamping
for Higher Productivity
for Fast Metal Removal

ISCAR **GRIP UP GRADE**

Member IMC Group

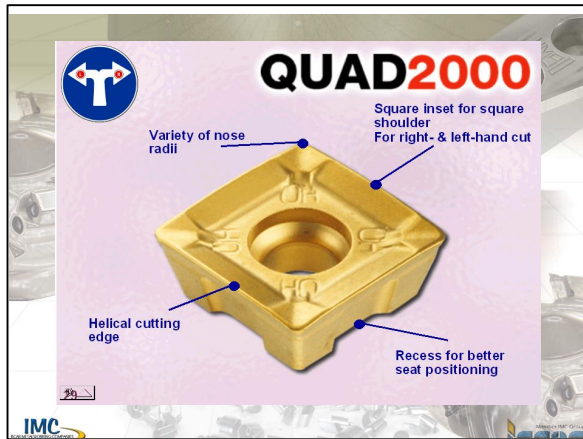
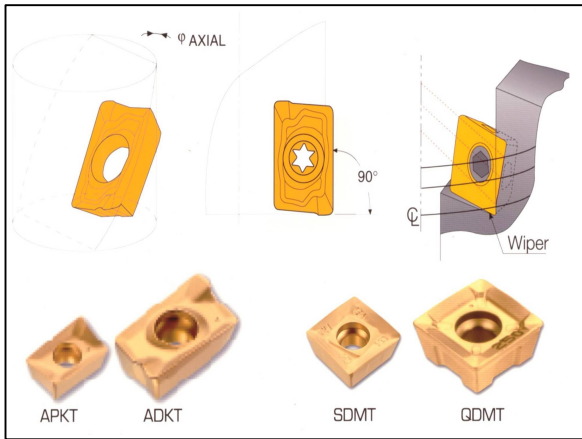
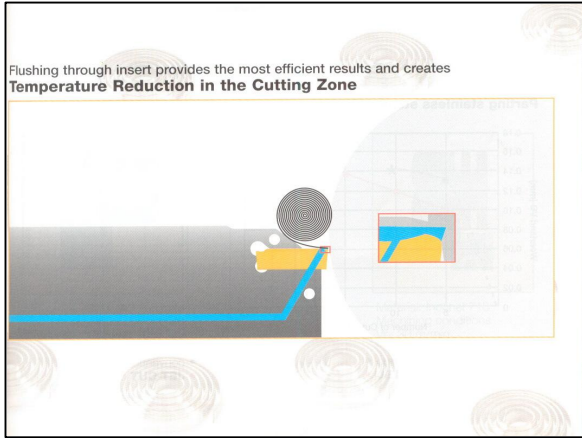
IG1023
 A tough, TAN/AlTiN PVD coated grade. Used for rough parting applications at low speeds, high feeds and interrupted cut. High resistance to mechanical and thermal shock.
 ISO 9001 ISO 14001

DO-GRIP
The Double Sided DO-GRIP Insert
with Internal Coolant Holes
For Parting Exotic Metals
Fast Metal Removal

ISCAR **GRIP UP GRADE**

Member IMC Group

ALTEC
908 New PVD AlTiN Coating for a Wide Range of Materials. Used for Parting and Grooving Applications.
 ISO 9001 ISO 14001 ISO 9002 ISO 14002



MILL 2000 The Millennium Line

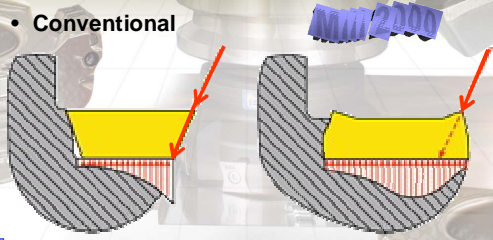
- The line that will improve productivity with a high metal removal rate



IMC

MILL 2000 Cutting Force Distribution

- Conventional

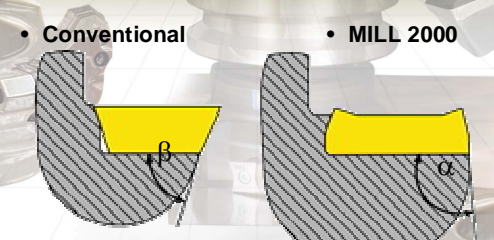


- Cutting force alignment
- Bottom of insert is wider than its top

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MILL 2000 Strength of Pocket's Edge

- Conventional
- MILL 2000



$\alpha \cdot \beta$

IMC



HELIDO 490

Double Sided Helical Insert with 4 Cutting Corners for Fast Metal Removal

ISCAR UP GRADE

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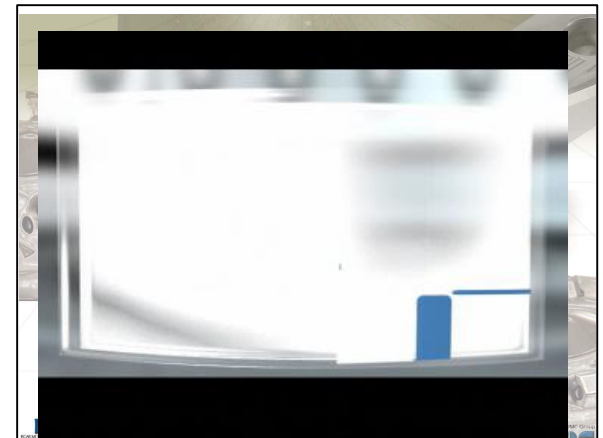


HELIDO 845

8 Cutting Corners on a Double Sided Helical Insert for Fast Metal Removal

ISCAR UP GRADE

Member IMC Group





NEW HELIOCTO Inserts

Wiper Insert OFCT 07 for Finishing

Super Positive OFCR 07 OECR 06 for Aluminum

Neutral Insert OFMT 07...AEN for Right- and Left-Hand Cutters

47 © ISCAR Customers Seminar 2000

16MILL

16 Economical Cutting Corners for Fast Metal Removal

Q-TEC 4100 New MTCVD Al₂O₃ Coating for Milling Grey Cast Iron in High Cutting Speeds for Extended Tool Life - ISO 9001 ISO 14001

DO-TEC 750 New CrN-PVD Double Coating for Milling Cast Iron in High Cutting Speeds ISO 9001

AL-TEC 910 New PVD AlTiN Coating for Milling Modular Cast Iron ISO 9001

ISCAR UP GRADE!

Member IMC Group

16MILL

Fine Pitch Facemill Cutter dia:80-250mm

Coarse Pitch Facemill Cutter dia:63-200mm

16MILL G

16MILL F45MM

Economical

ISCAR UPDATE!

New Screw Clamped Face Milling Line for Steel and Cast Iron

16MILL

Screw Clamped Facemill

Various Types of Chip Formers

16MILL F45MM

16MILL F45MM

TN-MM for Steel

TN for Cast Iron

WIPER INSERT

N-PL Positive Land

ISCAR UPDATE!

New Screw Clamped Face Milling Line for Steel and Cast Iron

16MILL

Adapter: BT50 SEM27X60

Tool: F45NM D080-06-27-R08

Insert: ONMU 080608-TN-MM IC328

Machining Conditions:

Vc: 150m/min (495 sfm)

Fz: 0.38mm/tooth (0.014 inch/tooth)

ap: 5mm (0.196 inch)

b: 56mm (2.204 inch)

Tool diameter [mm]	120
Number of teeth	18
Cutting speed [m/min]	180
Tooth feed [mm/tooth]	0.25
Table feed [m/min]	2063
Depth of cut [mm]	2.5
Width of cut [mm]	Variable
Flank wear [VB] [mm]	0.1
Tool life [min]	60

The former method used TNKF 1204... inserts with 6 cutting edges per insert. The ONMU 080608TN IC328 tool life is better and also power consumption is lower.

ISCAR UP TANG

立装刀片 新升代



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116年的 刀具公司
最早的 刀具专利 1889

The Ingersoll Milling Machine Co.,
ROCKFORD, ILLINOIS, U.S.A.

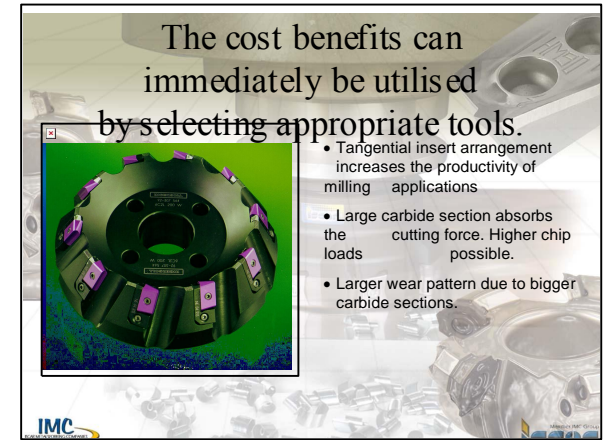
Today's Modern Designs



IMC

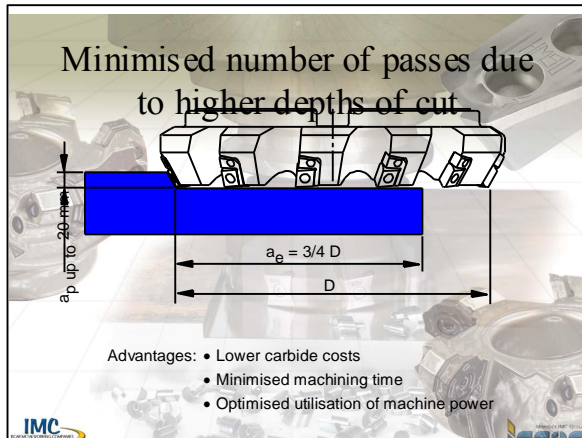
The cost benefits can immediately be utilised by selecting appropriate tools.

- Tangential insert arrangement increases the productivity of milling applications
- Large carbide section absorbs the cutting force. Higher chip loads possible.
- Larger wear pattern due to bigger carbide sections.



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Minimised number of passes due to higher depths of cut



Advantages:

- Lower carbide costs
- Minimised machining time
- Optimised utilisation of machine power

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立装刀片 压孔式面铣刀切削用量参考值

材料	硬度 HBS 抗拉强度 (MPa)	切削速度 v_c (m/min)		每齿进给量 (mm/z)		
		粗	精	面铣刀、三面刃铣刀		立铣刀
				负前角	正前角	
铸铁	<170HBS	$\phi 90$	90~120	0.5~1.2	0.3~0.9	0.15~0.4
	170~220HBS	55~80	75~105	0.3~1.0	0.3~0.6	0.1~0.3
	220~300HBS	45~60	$\phi 90$	0.2~0.8	0.2~0.6	0.1~0.2
结构钢	400~700MPa	$\phi 240$	150~300	0.3~1.0	0.2~0.8	0.15~0.4
	500~800MPa	90~180	120~240	0.3~0.9	0.2~0.8	0.1~0.3
合金钢	800~1100MPa	$\phi 120$	$\phi 120$	0.3~0.8	0.2~0.6	0.1~0.25
	1100~1400MPa	25~60	30~90	0.2~0.3	—	0.08~0.15
	铸钢	400~700MPa	25~90	35~140	0.3~1.0	0.3~0.8
黄铜	—	150~600	300~900	—	0.25~0.50	0.25~0.50
青铜	—	90~300	150~300	—	0.25~0.50	0.25~0.50
铝	—	900~1500	>1500	—	0.15~1.0	0.15~1.0
—	—	1500~4500	>1500	—	0.45~1.0	0.15~1.0

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Our standard is to provide inserts in different coated and uncoated carbide grades. For many tools we hold positive and negative inserts in stock.

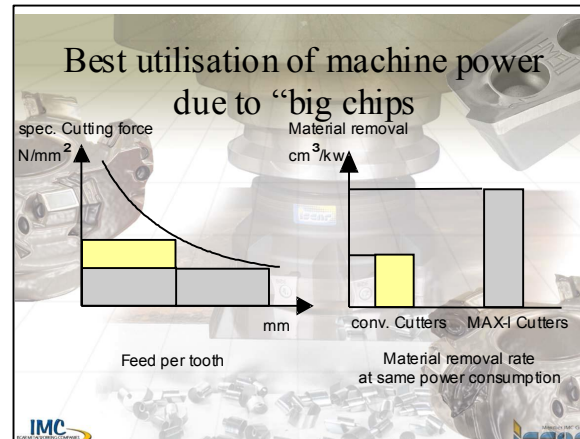
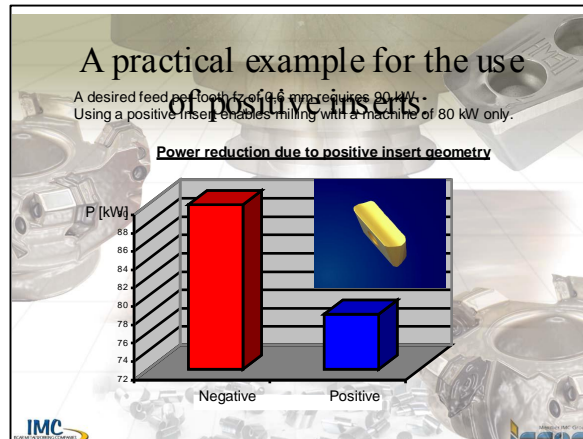


The cutter bodies are designed to take both geometries.

Furthermore the same inserts are used for both face mills and shoulder mills (90°).

This reduces storekeeping considerably.

IMC



TANGMILL BUTTERFLY

Tangential Milling

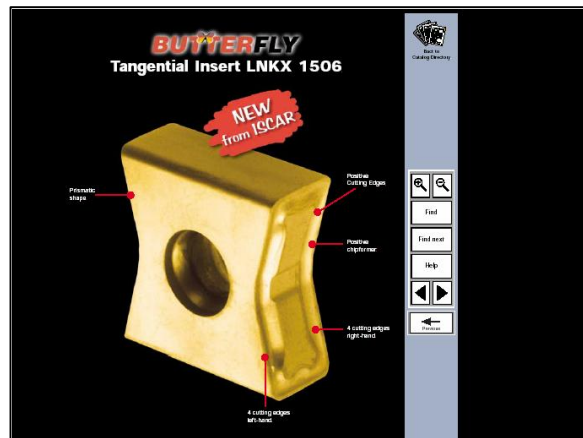
Old Milling Concept
Tangential Inserts

TANGMILL

NEW Milling Generation
Tangential Inserts

ISCAR UPGRADE!

TANGMILL NEW MILLING GENERATION



Positive Axial Rate Negative Axial Rate

TANGMILL Insert Standard BE Insert

The cutting forces generated when using the TANGMILL inserts are 15-20% lower than those of standard tools using BE inserts. The reduction of cutting forces is essential for modern machining centers with rigid systems that are sensitive to the traditional transfer lines. As the cutting depth mechanisms, when using the positive TANGMILL inserts, the axial forces become balanced and the stability is improved. (See Fig. 3)

Fig. 3



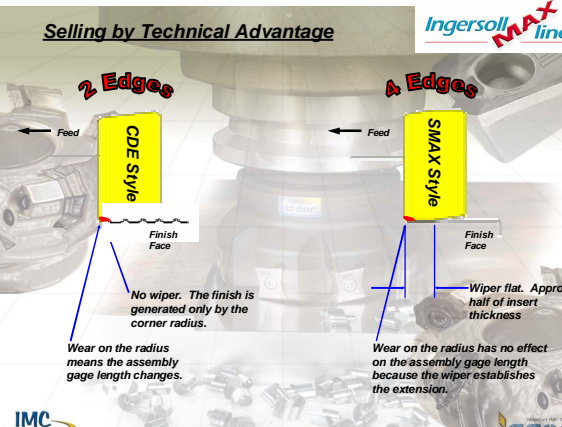
MAX
RH 25MM Insert - DPM436

Ingersoll **MAX** line

- Goal is to replace 9D2G and provide a new cutter with 45 deg lead and .500" doc capability.
- Pressed complete; +/- .002" tolerance.
- Strong .375" thick; M5 insert screw.
- Pressed .008" wide neutral cut edge land around entire periphery.
- IN1530 and IN2040 Grades.

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Selling by Technical Advantage



2 Edges
CDE Style

4 Edges
SMAX Style

Feed

Finish Face

No wiper. The finish is generated only by the corner radius.

Wear on the radius means the assembly gage length changes.

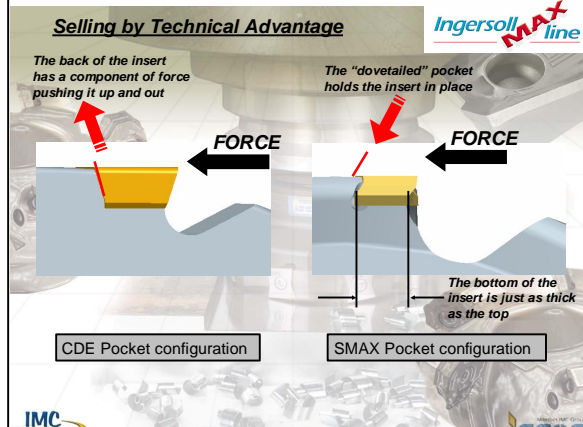
Finish Face

Wiper flat. Approx. half of insert thickness

Wear on the radius has no effect on the assembly gage length because the wiper establishes the extension.

IMC

Selling by Technical Advantage



The back of the insert has a component of force pushing it up and out

The "dovetailed" pocket holds the insert in place

FORCE

FORCE

The bottom of the insert is just as thick as the top

CDE Pocket configuration

SMAX Pocket configuration

IMC



ISCAR MILL LINE

MINITANG
4 Cutting Corners,
Tangential Geometry
for Fast Metal Removal

MINITANG TANGMILL

ISCAR UP GRADE

IMC

TANGMILL
MINITANG

MINITANG
ISCAR UP GRADE!

TANGMILL FAMILY

miniTANG Insert miniTANG Tools

ISCAR UP GRADE!

TANGMILL NEW MILLING GENERATION

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TANGMILL
TANGPLUNGE

TANGPLUNGE **TANGPLUNGE**

ISCAR UP GRADE!

ISCAR UP GRADE!

TANGPLUNGE NEW Plunging Generation

IMC

TANGMILL
TANGPLUNGE

TANGPLUNGE **TANGPLUNGE**

14mm Width of Cut

ISCAR UP GRADE!

ISCAR UP GRADE!

- Insert with 4 Reinforced Cutting Edges
- Tangential Positive Insert with Chip Breaker

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TANGMILL
TANGPLUNGE

TANGPLUNGE **TANGPLUNGE**

Plunge 50-100mm (2"-4")

ISCAR UP GRADE!

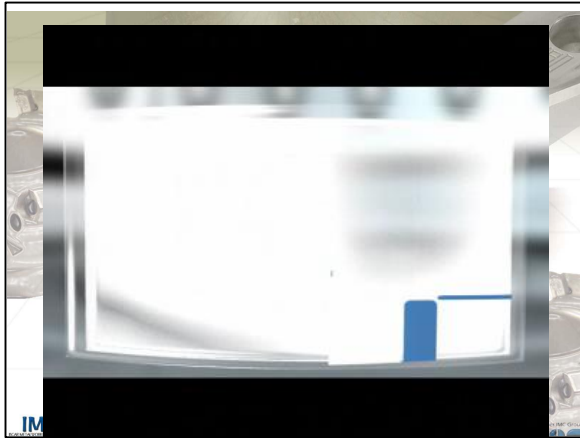
ISCAR UP GRADE!

- Plunging Cutters Can also be Used for Facing
- ZERO Flatness with Excellent Surface Quality

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ISCAR GRIP LINE
Fast Metal Removal

<p>SGSF-Coarse Pitch</p>	<p>SGSA-Fine Pitch</p>
<p>GSFN & SGSF 6" ...10Z</p>	<p>GSAN & Cutter-SGSA 6" ...30Z</p>

ISCAR UPDATE!

ISCAR GRIP LINE
Fast Metal Removal

<p>SGSF-Coarse Pitch</p>	<p>SGSA-Fine Pitch</p>
<p>GSFN & SGSF 6" ...10Z</p>	<p>GSAN & Cutter-SGSA 6" ...30Z</p>

ISCAR GRIP LINE
Fast Metal Removal

<p>CHAM</p>	<p>SLITTING</p>
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ISCAR UPDATE!

ISACR UP SHRED

波形刃 新升代

波型刃 铣刀

Incredible Removal Rates with ISCAR's New Family of SHRED Milling Cutters

MILLSHRED

MASTERSHRED

SOLIDSHRED

ISO SHRED

HELISHRED

F.M.R. > 400 mm

IMC

的切削

- 波形刃交错搭接的齿形组合可进行大载荷的切削，而大大提高了金属切除率
- 波形刃刀片和普通圆刀片可装同一刀体，选择自由

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SHREDMILL

IMC

3b **COMPETITOR** vs **3c** **MILLSHRED**

Adapter: BT50 SEMC 27x80
Tool: DEPO 5 66 30 D66-R8-13C
Insert: 4168S P25 DC2 45401
Machining Conditions:
Vc : 150 m/min (495 sfm)
fz : 0.25 mm/tooth (0.009 inch/tooth)
ap : 6 mm (0.236 inch)
b : 66 mm (2.598 inch)

Adapter: BT50 SEM 22x140
Tool: FRW D05 A 12-15-22-16
Insert: FCMT160-FW IC908
Machining Conditions:
Vc : 150 m/min (495 sfm)
fz : 0.32 mm/tooth (0.012 inch/tooth)
ap : 6 mm (0.236 inch)
b : 66 mm (2.598 inch)

NO VIBRATIONS

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TANGMILL

The Tangential Insert with 4 Serrated Cutting Edges for Fast Metal Removal

These TANGMILL Inserts Can Fit on the Same Cutter Body

- General Applications
- Wiper insert for Finishing Operations
- For Elimination of Chipping on the Workpiece Edge
- For 90° High Shouldering
- Positive Rake Angle and a Sharp Cutting Edge
- Ceramic Insert for Cast Iron

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Finisher **Rougher**

ISCAR UPGRADE!

FINISHRED

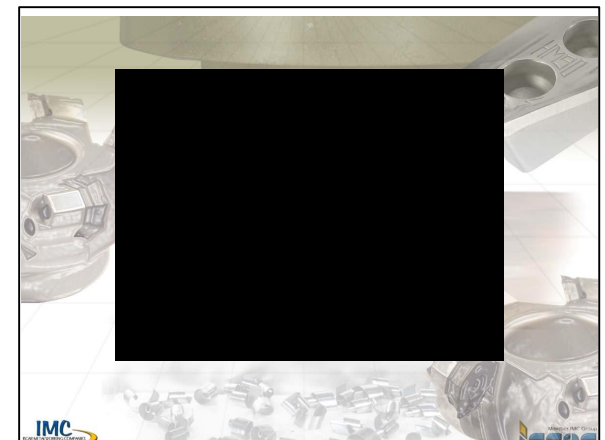
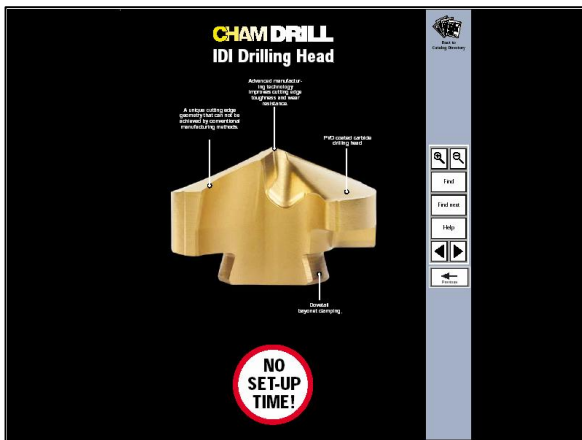
2 Applications in 1 Solid Carbide Endmill for Fast Metal Removal

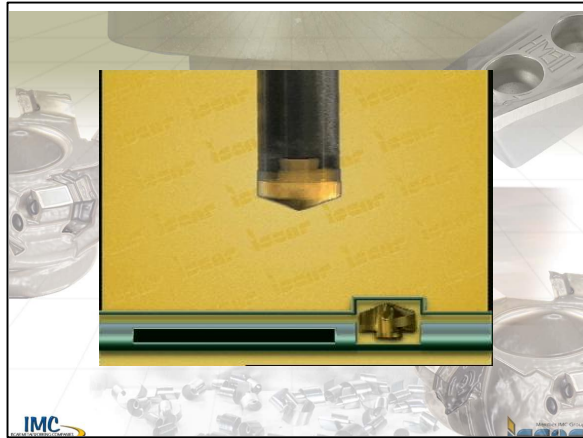
AL-TEC 900

300

ISCAR UPGRADE

IMC





UNICHAMDRILL
A Whole New Approach to **Holemaking**

4 : 1
COST COMPARISON

Solid Carbide Drill

- Risk of unpredictable performance after regrinding
- High cost of stock in service

CHAMDRILL

- Extended tool life
- Outstanding repeatability
- Reduced stock cost

One Tool for 10 Different Intermediate Sizes

Insert Diameter Range: 7.3-20 mm (288"-787")

• Flares to increasing sizes of 1 mm (0.4") increments

30 : 1
SETUP TIME COMPARISON

NO SET-UP TIME!

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CHAMDRILL FF

Expanding to a New Diameter Range for Increased Hole Production for **Fast Metal Removal**

DRILL UP GRADE

Member: IMC Group

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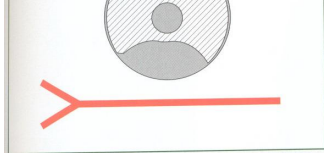
Twisted Coolant Holes with Unique Gullets for Excellent Chip Evacuation

High Surface Quality and Hole Accuracy for **Fast Metal Removal**

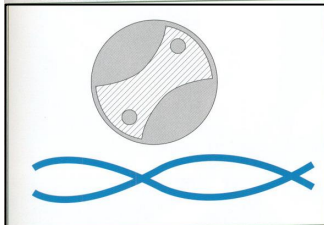
DRILL UP GRADE

Member: IMC Group

IMC

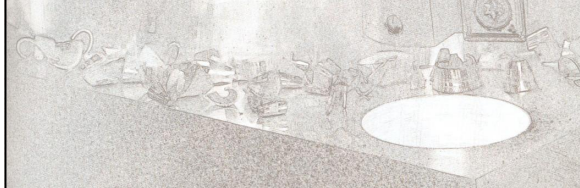


DR Standard Concept



- More than 10% larger chip flow area.
- Stronger core design.
- Two twisted coolant holes periphery located.

DR-TWIST Concept



BAYO-FREAM
Solid Carbide Interchangeable Heads
with Indexing Repeatability
of 3 Microns

for Fast Metal Removal

ISCAR DRILL UP GRADE

	ISCAR	Competitor
Bit/reamer designation	RM-BN7-0.7501SA-90	
Carbide grade	IC308	C2
Hole diameter [mm]	19.052 ± 0.004	19.052 ± 0.004
Hole depth [mm]	50.800	50.800
Spindle speed [rpm]	1000	400
Feed rate [mm/rev]	0.61	.127
Surface quality	Excellent	Good
Holes per cutting edge	2800	1050
Tool life [min]	1000	600
Length per cutting edge [meter]	143	52

Reduces cycle time and maintains 1.5 µm finish
 Operation cycle time reduced from 4.7 minutes to 2.5 minutes for seven holes.

ISCAR UP GRADE!
for Fast Metal Removal

Member BAC Group
ISCAR

Performance

Fast TURN
 Trial Milling Insert

HEAVY DUTY
 Milling Milling Milling

DRILLJET
 No Setup Time!

Member BAC Group
ISCAR